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THIS REPORT DISCUSSES LEXICOGRAPHICAL CLASSIFICATION OF FOLK TERMS. THE CONCERNS OF SUCH CLASSIFICATION ARE DESCRIBED AS (1) IDENTIFYING RELEVANT SYNTACTIC STRUCTURES, (2) IDENTIFYING FUNDAMENTAL SEMANTIC UNITS IN SPECIFIC CONTEXTS, (3) DELINEATING SIGNIFICANT SETS OF SEMANTIC UNITS IN PARTICULAR DOMAINS, AND (4) TRANSLATING AND MARKING THE SEMANTIC UNITS TO BRING OUT IMPORTANT UNIT RELATIONSHIPS. THIS REPORT IS ONE OF A SERIES OF 13 PAPERS PRESENTED AT A CONFERENCE ON LEXICOGRAPHY, INDIANA UNIVERSITY, NOVEMBER 11-12, 1960. (JH)

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Workpaper for Conference on Lexicography
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LEXICOGRAPHICAL TREATMENT OF FOLK TAXONOMIES

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0. Introduction. Many lexical problems are of considerable importance to linguists and ethnographers. With the interests of both groups in mind, I would like to discuss certain aspects of folk classification which I feel deserve more rigorous lexicographic attention than they have sometimes received.

An adequate ethnographic description of the culture [9]* of a particular society presupposes a detailed analysis of the communications system and of the culturally defined situations in which all relevant distinctions in that system occur. In this regard, accurate knowledge of both the grammar and lexicon of the local spoken language constitutes a minimum requirement. When the ethnographer works in an area for which adequate statements about the local language are unavailable in published sources, his first and often continuing task is the construction of a set of valid rules for the interpretation of the local language. In his syntactic analysis of new speech forms,

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* Numbers in brackets refer to references listed in 5., below.

he may find many helpful models in the descriptive linguistic literature. In attempting, however, to account for the obligatory semantic relations inherent in his lexical corpus, he may not be so fortunate. While extant dictionaries and vocabularies do provide glosses and definitional information, many of the non-trivial, and often essential, semantic and contextual relationships obtaining among lexical items are often either neglected or handled in an imprecise and unsystematic manner.

For syntactic analysis it is necessary that utterances be acceptable and interpretable grammatically. For ethnographic (lexicographic) analysis utterances must also be acceptable and interpretable semantically [7]. This difference is noticeable even in the treatment of isolated forms. A simple illustration may clarify this point.

In the course of several years of linguistic and ethnographic field work among the Hanunóo in the Philippines, it became abundantly evident that providing such segments as sah, tabākuq, sanparansisku-qalistun, and lāda'balaynun'tagnānam'qiruŋ-pādiq each with the same gloss '(distinct) kind of plant' was--while adequate syntactically--most inappropriate to my other task of semantic analysis. Had I not modified this procedure, I would have ended up with more than 2000

lexical items each labeled identically. While employing glosses such as 'tea' and 'tobacco' (in the first two cases above) proved useful in familiar circumstances, the vast majority of such culturally significant designations referred to situations unfamiliar to me. In this type of ethnographic context one finds many instances where the problems faced traditionally by the compilers of bilingual dictionaries are magnified [16]. For the ethnographer, the semantic structure of such folk classification is of paramount significance. Upon his analysis of it depends the accuracy of many crucial statements about the culture being described. Problems of analyzing and presenting such structures in a succinct fashion may be of interest even to lexicographers who work only in relatively familiar cultural surroundings.

1. Folk classification. In the lexicographic treatment of folk classification, we are concerned primarily with (1) the identification of relevant syntactic segments, (2) the identification of fundamental semantic units in specific contexts, (3) the delineation of significant sets of semantic units in particular domains, and (4) the translation (and marking) of these units so that important semantic relationships will not be obscured. In discussing different systems of classifying segments of the natural and

social environment, the neutral term segregate serves as a label for any terminologically-distinguished grouping of empirical phenomena.

1.1. Linguistic structure. The shape and combinatorial structure of the linguistic forms which designate folk segregates are irrelevant, in a strict sense, to the analysis of the system of classification itself; i.e., to the semantic structure [5]. Labels and categories can change independently and therefore must be analyzed separately. On the other hand, a knowledge of the linguistic structure involved is essential for understanding the principles of folk nomenclature, and in working out this structure, clues for isolating folk segregate labels and for eliciting information about such segregates may be found.

1.2. Lexical units and contexts. A full lexical statement (i.e., an adequate dictionary) should provide formal and semantic identification for every morpheme and morpheme combination the meaning of which does not follow from the signification and arrangement of its parts [9, 16], together with an indication of specified immediate contexts in which such lexical units occur. Lexical units may be either simple lexemes, segments which are exocentric both syntactically and semantically (such as newt, pineapple, and jack-in-the-pulpit); or compound lexemes, constructions which

are syntactically endocentric, but which are semantically exocentric (except under specified nonimmediate circumstances; examples: Port-Orford cedar, Baldwin apple). By contrast, nonlexical units are utterance constituents which are semantically endocentric in all known contexts (e.g., long pink strand, sunburned face) [16]. For a native speaker, these distinctions may cause little difficulty, but in new linguistic and cultural environs difficulties may arise.

For example, on first inspection, the following partially-identical Hanunóo forms [3] might appear to belong to a simple paradigm (they could all be recorded during a conversation about rice cultivation and weeding problems):

1	paray:paray	'cattail'
2	pāray.māyah	'immature wild pādaŋ (plant)'
3	pāray.qiŋkantuh	'kind of wild sedge'
4	pāray.bīhud	'kind of rice'
5	pāray.tāwuh	'some one (else)'s rice'
6	pāray.tīdah	'that rice'

The glosses, however, indicate that several types of lexical units may be involved. Are there any formal linguistic clues?

Each of the six forms is easily segmented into two morphs, as I have indicated by the use of dots. Loose-joining, phonemically, is represented by a single period.

Except for the closely-joined doubling in item number 1, the forms in this set provide no obligatory intonational or junctural contrasts. And each occurs in many identical frames such as tūhay ŋāni ti _____. '_____ is (are) certainly different.' Thus, for most of the semantically distinct types of joining suggested by the glosses, there are no formal indications. Given the necessary semantic information, however, these distinctions can be noted easily for lexicographical purposes by rewriting the forms as follows:

1 parayparay
2 pāray-māyah
3 pāray-qiŋkantuh
4 pāray'bīhud
5 pāray (5a) tāwuh (5b)
6 pāray (6a) tīdah (6b)

This procedure clearly marks the first three as completely exocentric, simple lexemes; the fourth as a compound lexeme; and the last two as nonlexemic, semantically endocentric constructions the first lexeme of which is superordinately related to the fourth. Minimally, forms 1, 2, 3, 4, 5a, and 6a could be labelled 'kind of plant,' but by not attending to essential semantic distinctions this type of short cut would obscure such important contrastive relations as the

mutual exclusion of coordinate categories (1 : [pādan], implied--but not covered--by the specific growth stage term number 2] : 3 : 5a or 6a), and the possible total inclusion of subordinate categories (4 by 5a/6a, but not 1, 2, or 3 by 5a/6a). Statements about such relations, hinted at in some glosses and definitions, may be demonstrated only by systematic pairing in minimal and relatively controlled, linguistic and semantic contexts.

1.3. Lexical sets and domains. In many ways it can be said that the more discrete the phenomena referred to, the simpler the task of treating the associated terminology in a lexicographically adequate manner [22]. If this is true for particular lexical items it is equally true for the semantically structured sets which such items may comprise [7]. Minimally, a lexical set consists of all semantically contrastive lexemes which in a given, culturally relevant context share exclusively at least one defining feature [14]. The semantic range of all such lexemes defines the domain of the lexical set. The establishment of domain boundaries, while widely recognized as an ideal goal, is often a very difficult task [21]. Effective eliciting frames and procedural tests used to establish such boundaries, and convincing demonstrations of their intracultural reality, are subjects not often

discussed in the linguistic or ethnological literature. Some of the essential factors involved in this type of analysis are treated briefly below under "levels" (2.) and "dimensions" (3.) of contrast. In general, the areas of overlap between domains in the lexical realm of the same language appear to increase in number and complexity when one attempts to "match" the domains of different languages [17]. This does not, however, make such situations unamenable to rigorous contrastive analysis.

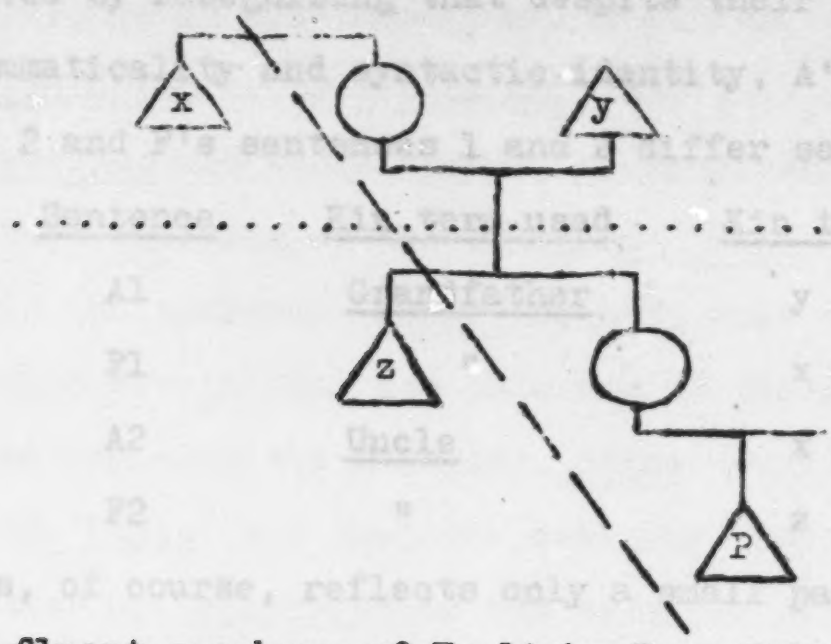
1.4. Translation and semantic structure. With few exceptions, the lexical items employed in systems of folk classification always comprise a segment of the everyday vocabulary of a particular language [5]. The rules governing the obligatory semantic relations among the categories in such lexical sets are thus to be discovered, evaluated, and described for each language. Such rules cannot be prescribed merely on the basis of familiarity, in another system, with the "concrete" denotata of the sets involved. In the case of folk botany, for example, this means that a local system of plant classification cannot be described accurately by attempting to obtain only vernacular "equivalents" for recognized botanical species. Translation labels (glosses) are frequently necessary but they should be considered neither as definitions nor as

exact equivalents [14]. This well-established and perhaps obvious semantic principle is sometimes forgotten where the assumed absolute nature (in a cross linguistic sense) of "scientific" names or of other long-established traditional distinctions in certain Western languages are involved [17].

1.5. Syntactic vs. semantic structure. Implicit in the preceding remarks is the assumption that the relation between formal linguistic (syntactic) structure and semantic structure need not be isomorphic [14]. If this assumption is taken seriously, a full dictionary should state explicitly the necessary and sufficient conditions for the unambiguous structural interpretation of each included lexeme in the context of the total lexicon as well as in that of the grammar. While this goal is rarely achieved, I feel that it has considerable relevance for this discussion. A simple illustration may help to indicate the kind of crucial lexical data that are often ignored, especially where meanings are either assumed on the basis of semantic patterning in a more familiar language, or where they are treated only partially (as in the derivation of definitional statements from translational labels).

Consider the following situation (which, with minor differences, I have witnessed on a number of occasions): A woman, whose brother (x) and husband (y)

are both named Juan, has a son, also named Juan (z), and a daughter who in turn has a son named Pedro (P). The genealogical situation is easily diagrammed as follows (we can ignore the dotted lines for a moment):



Two fluent speakers of English, F, a Filipino whose first language was Tagalog, and A, a native speaker of a dialect of American English, both know Pedro and the enumerated members of his family. The fact that one of the Juans (x, y, or z) has died is known only to A (or F) who in turn wishes to relate this circumstance to his friend F (or A). A simple statement filling the frame P's _____ Juan died. would seem to do the trick, and, depending on the circumstances, one of two simple lexemes might be used to fill the blank (grandfather, uncle):

1 Pedro's grandfather died.

2 Pedro's uncle died.

However, if A used grandfather, F may ask Which grandfather?; if F uses uncle, A may ask Which uncle? indicating a kind of two-way ambiguity which can only be solved by recognizing that despite their unquestionable grammaticality and syntactic identity, A's sentences 1 and 2 and F's sentences 1 and 2 differ semantically:

Sentence	Kin term used	Kin type(s) included	
A1	Grandfather	y	(PrFa)
F1	"	x and y	(PrFa,PrPrBr)
A2	Uncle	x and z	(PrBr,PrPrBr)
F2	"	z	(PrBr)

This, of course, reflects only a small part of a very fundamental structural difference in Central Philippine and North American systems of kinship classification: universal terminological recognition of generation in the former vs. universal terminological recognition of degree of collaterality in the latter (these two "limits" to the lexical extension of kin class membership are indicated on the kinship diagram above by the horizontal dotted line and diagonal broken line, respectively). Although any careful investigator might learn this systematic distinction after a few days of field work, the principle goes unaccounted for in the relevant and extant bilingual dictionaries. The restrictions involved in this illustration are just as obligatory

and inescapable within the respective semantic systems represented as is the distinction of singular vs. plural in English grammar.

2. Levels of contrast. Folk categories may be related in two fundamentally different ways: by inclusion or by exclusion (there may also be categoric overlap and subcategoric, or componential, intersection). When we speak of the category 'dimes' being included in the category 'coins' we mean that every dime is also a coin (but not necessarily the reverse). When we say that the category coins contrasts with that of bills and that the category 'dimes' contrasts with that of 'quarters' we are speaking of two instances of mutual exclusion at two different levels of contrast [4, 5, 7]. Such alignments of folk categories are common to all languages, though systematic indications of these relationships are rare even in the more detailed monolingual dictionaries.

2.1. Hierarchic structure. Where the articulation between successive levels, each consisting of a set of contrastive lexical units is ordered vertically by inclusion such that each monolexemic category at one level is totally included in only one category at the next higher level, we can speak of a lexical hierarchy. The two axes of such a structure involve the horizontal differentiation of contrastive but coordinate categories

and the vertical increase of generalization or specification resulting from ascent to superordinate (including) or descent to subordinate (included) levels, respectively [2,5,7,10]. These axes are fixed and cannot be merged or interchanged, nor can the succesion of levels be modified. Dimes are not contrasted at the same level with coins but with nickels, quarters, pennies. Furthermore, subhierarchies are often discernable within larger hierarchic structures. For example, there is a closer contrast (indicating inclusion in a separate subhierarchy) differentiating crows, hawks, and starlings, then between hawks and horses.

2.2. Folk taxonomy. A system of monolexemically-labelled folk segregates related by hierarchic inclusion is a folk taxonomy; segregates included in such a classification are known as folk taxa [5]. Some of the additional requirements of model or "regular" taxonomic systems [2,10,18] are: (1) at the highest level, there is only one maximal (largest, unique) taxon which includes all other taxa in the system; (2) the number of levels is finite and uniform throughout the system; (3) each taxon belongs to only one level; (4) there is no overlap (i.e., taxa at the same level are always mutually exclusive. Folk systems vary widely with respect to these more specific "requirement," but the presence of hierarchically arranged though less "regular" folk taxonomies is probably universal. Most of the examples

given here are taken from folk botany, but similar illustrations could be taken from other general, semantic domains [7,20].

Several important differences distinguish folk taxa from the taxonomic groups of biological systematics [5]. The former usually relate only to locally observable phenomena. They are defined by criteria which may differ greatly from culture to culture. The number and position of levels of contrast may change from one folk system to another. There are no formal rules for the recognition or rejection of taxa, though new groupings may be added productively with considerable ease. In respect to any particular local biota, there is no reason to expect the folk taxa to match those of systematic biology -- either in number or in size. The Hanunóo classify their local plant world, at the lowest (terminal) level of contrast, into more than 1800 mutually exclusive folk taxa, while botanists divide the same flora -- in terms of species -- into less than 1300 scientific taxa.

2.3. Special problems. Although they cannot be discussed here at length, a number of lexicographically important problems encountered in the analysis of folk taxonomies include: (1) Multiple and interlocking hierarchies. Unlike scientific taxa, folk segregates

may belong simultaneously to several distinct hierarchic structures. The same segregates may be classed as terminal categories in a taxonomy based on form and appearance and also as terminal or nonterminal categories in another taxonomy based on cultural treatment (e.g., morphologically distinguished kinds of floral segregates vs. functional categories of plants as food cultigens, medicines, ornamentals, etc.) [3].

(2) Synonymy. When, within the context of a particular folk taxonomy, a single taxon may be labelled by either of two or more phonemically distinct forms, as in the case of minor dialect variants, referential synonyms may not present too serious a probelm. But when partial inclusion or overlap is involved, or where lexemes designating separate ontogenetic stages of the members of a particular segregate (see 1.2 above) must be distinguished from those which designate parts of the individuals comprising a certain segregate instead of designating taxa as such, numerous difficulties may result [3,5,7]. (3) Homonymy. Lexemes of the same phonemic shape may designate related taxa of different ranges of generalization at successive levels in folk taxonomies. Such situations (e.g., animals[1] vs. plants, animals[2] vs. birds) are not uncommon but require careful contrastive pairing at each level involved.

2.4. Folk vs. botanical taxonomy. Ideally, in the study of interrelated lexical sets in folk taxonomies, priority and preference should be given to unanimously-agreed-upon, obligatory distinctions in specified contexts. When tested by means of what are essentially crucial experiments -- by pairing and contrasting negatively and positively -- one should be able to construct a model (i.e., a theoretical statement) of the hierarchic structure such that assertions of membership and inclusion in any of the implied taxa are unanimously and unambiguously denied whenever such assertions are incongruent (i.e., meaningless within the system)[12]. The assertion 'Salmon and fish are kinds of horses' would thus be rejected by speakers of my dialect of English -- and on very easily specified semantic grounds. Within a particular universe of discourse (a taxonomic domain) how can one construct a nontrivial model so that its implications will yield (or generate, if you wish) only semantically acceptable propositions? One small example from Hanunóo folk botany may serve as a partial answer.

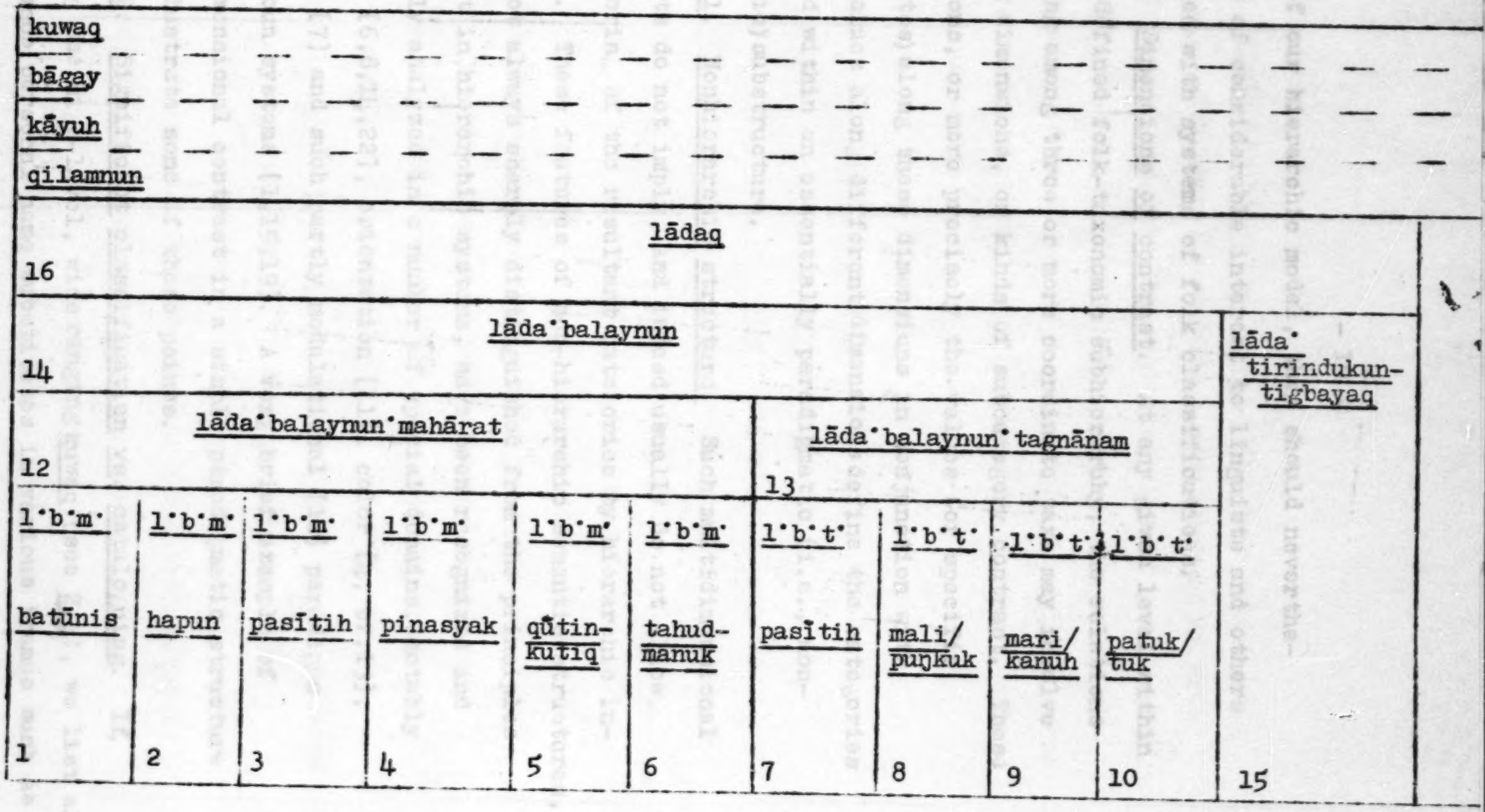
In a situation where a Hanunóo farmer, A, wishes to draw B's attention to a particular individual pepper bush x, he may, of course, attempt to describe some of x's unique attributes without naming the plant. Much

more often, however, even in the course of a "unique" description, he will resort to the use of one or more of at least eight lexical units each of which might complete the frame <u>māluq, qinda pag</u> _____, 'Hey, take a look at this _____,' but at different levels of contrast (allowing for different degrees of desired or required specificity):

I	<u>kuwaq</u>	'entity' (i.e., something that can be named)
II	<u>bāgay</u>	'thing' (not a person, animal, etc.)
III	<u>kāyuh</u>	'plant' (not a rock, etc.)
IV	<u>qilamnun</u>	'herbaceous plant' (not a woody plant, etc.)
V	<u>lādaq</u>	'pepper (plant)' (not a rice plant, etc.)
VI	<u>lāda·balaynun</u>	'houseyard pepper (plant)' (not a wild pepper plant)
VII	<u>lāda·balaynun·mahārat</u>	'houseyard chili pepper (plant)' (not a houseyard green pepper plant)
VIII	<u>lāda·balaynun·mahārat·qūtin-kutiq</u>	'"cat-penis" houseyard chili pepper (plant)' (not a member of any of five other terminal houseyard chili pepper taxa such as <u>lāda·balaynun·mahārat·tāhud-manuk</u>, the "cock's-spur" variety).

Within the domain of Hanunóo plant taxonomy, from level III down, and specifically within the range of lãdaq, from level V down, conversations recorded during many similar situations would ultimately provide the lexicographer with sixteen lexemes (including a terminal set of eleven 'pepper plant' names) arranged at four levels in the form of a discrete subhierarchy (Fig. 1). Specification below the level of the terminal taxa noted in the diagram (Fig.1:1-11), and hence outside this system of classification, may be provided only by semantically endocentric constructions describing individual plant variations, on which unanimous accord is rare and unpredictable. In this particular case, folk taxa 16, 14, and 15 happen to correspond rather closely with the scientific taxa Capsicum spp., C. annuum L., and C. frutescens L., respectively; but the twelve remaining folk taxa involve distinctions not recognized as significant botanical subspecies by taxonomic botanists who have classified the same flora. Structurally speaking, however, some of the most important patterns of semantic contrast involve not only the hierarchic separation of these varied, lower-level, folk taxa, but also involve a large number of nonhierarchic relations governed by subtaxa class intersection. Although such relations cannot be diagrammed with the taxonomic implications of Figure 1, nor can they be treated effectively at all in

Figure 1. A segment of Hanunóo plant taxonomy. All folk taxa included in the taxon lādaq, are indicated. ("Hyphenation" of forms other than at morph boundaries is shown by a slash.)



terms of our hierarchic model, they should nevertheless be of considerable interest to linguists and others concerned with systems of folk classifications.

3. Dimensions of contrast. At any given level within a well-defined folk-taxonomic subhierarchy, the relations obtaining among three or more coordinate taxa may involve varying dimensions, or kinds of subcategory contrast. These dimensions, or more precisely the values (or specific attributes) along these dimensions in conjunction with other values along different dimensions define the categories involved within an essentially paradigmatic (i.e., non-taxonomic) substructure.

3.1. Nonhierarchic structure. Such multidimensional contrasts do not imply, and indeed usually do not allow, the ordering of the resultant categories by hierarchic inclusion. These features of non-hierarchic semantic structures, while not always sharply distinguished from the principles inherent in hierarchic systems, have been recognized and carefully analyzed in a number of special domains, notably kinship [6,8,14,22], orientation [11], color [4, cf.13], disease [7] and such partly modulational [12] paradigms as pronoun systems [1,15,19]. A very brief example of multidimensional contrast in a simple paradigmatic structure will illustrate some of these points.

3.2. Significant classification vs. cataloguing. If, omitting the high-level, wide ranging kuwaq (see 2.4), we list all the Hanunóo personal name substitutes in various frames such as

māluq, ginda pag binwat ni _____, 'Hey, take a look at what _____ did (here),' we will invariably end up with an exhaustive and mutually exclusive lexical set consisting of just eight units (in each case representing a single morpheme). Arranged in the least meaningful type of catalogue, an alphabetical index (as in a dictionary), these lexical units are:

dah	'they'
kuh	'I'
mih	'we'
muh	'you'
tah	'we two'
tam	'we all'
yah	'he, she'
yuh	'you all'

The shapes provide little that is structurally suggestive, but the glosses do indicate that an ordering in terms of eight "traditional" distinctions along three quasi-semantic dimensions

1 first person : second person : third person
2 singular : dual : plural
3 exclusive : inclusive

might be attempted. But the resulting applied structure is hardly elegant, economical or convincing:

kuh 1s	tah 1d	mih 1pe
---	---	tam 1pi
muh 2s	---	yuh 2p
yah 3s	___	dah 3p

If a close examination is made of the distinctive contrasts involved, not in terms of labels but in terms of actual, minimal, obligatory differences, a more satisfactory, economical, and semantically verifiable solution is reached. The necessary and sufficient conditions for defining each of the eight categories depends on the regular intersection of six components which comprise three simple oppositions:

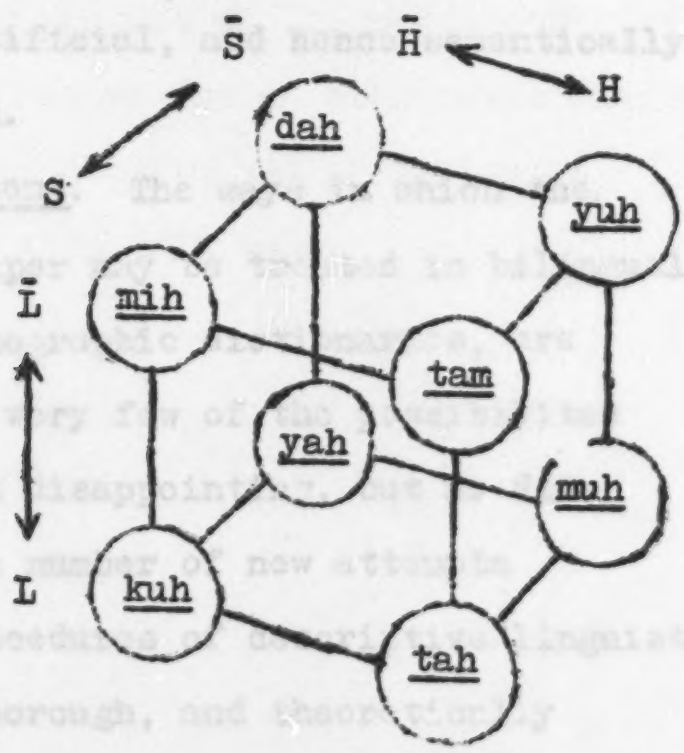
limited membership : unlimited membership (I:$\bar{I}$)

inclusion of speaker : exclusion of speaker (S:$\bar{S}$)

inclusion of hearer : exclusion of hearer (H:$\bar{H}$)

Thus:

dah	$\bar{I}\bar{S}\bar{H}$	or
yuh	$\bar{I}\bar{S}H$	
mih	$\bar{I}S\bar{H}$	
tam	$\bar{I}SH$	
yah	$I\bar{S}\bar{H}$	
muh	$I\bar{S}H$	
kuh	$IS\bar{H}$	
tah	ISH	



Even without further discussion, the basic semantic structure of this lexical set should now be clear. (It is not surprising that pronoun systems in Tagalog, Ilocano [19], Maranao [15], and some other Philippine languages exhibit similar, if not identical, obligatory semantic relationships.) This material also demonstrates that within such a contrastive lexical set, ordered by class intersection, the constituent categories cannot be arranged in a taxonomic hierarchy. Any arrangement (e.g., a branching diagram) superficially appearing to contradict this statement will prove on closer inspection either to constitute what the biologists call a key, essentially another kind of catalogue ordered by successive -- but not necessarily significant -- dichotomous exclusion, or to be based on some other artificial, and hence semantically, nonsignificant classification.

4. Lexicographic treatment. The ways in which the problems mentioned in this paper may be treated in bilingual dictionaries, especially ethnographic dictionaries, are practically unlimited. That very few of the possibilites have been explored to date is disappointing, but no discouraging. There have been a number of new attempts at expanding the analytic procedures of descriptive linguistics to include a more rigorous thorough, and theoretically rewarding analysis of semantic structure [9,14,16,20,21, 22]. Despite these more encouraging signs, I realize that

most dictionaries will continue to be organized primarily as alphabetical catalogues. Suggestions regarding the ways in which structural semantic information (especially with reference to folk taxonomies) might be more adequately covered in such dictionaries would include: (1) consistent marking of each entry as to its status as a lexical unit and taxon, its immediately subordinate and superordinate taxa, and all coordinate taxa included in the next higher taxon (simple diacritics and abbreviations can be devised for systematic use in compilation and checking); (2) differential marking of translation labels and definitions; (3) concise indication of distinctive attributes of categories belonging to analyzed lexical sets; (4) systematic cross-referencing to maximal taxa in all major subhierarchies, to referential synonyms, and to all units involved in categoric overlap; (5) greater use of structural charts and diagrams; and (6) greater caution and precision in associating scientific taxa with folk taxa.

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